terminal device. Because the base station has not the use of an Si(ti) value of the kind as that of the terminal device, calculated based on a regularly received control signal, the base station determines the value of the next transmission power by using a suitable function, in which the value of the transmission power is at least as big as value Sc(tc) but approaches in the course of time the maximum power Smax. A man skilled in the art can easily provide several suitable functions.

With reference to FIG. **3**, there is described a method in accordance with the present invention as a simplified flow chart. The markings of the figure refer especially to the terminal device, because the determination of the value Si(ti) is described therein. Applied to the base station, value Si(ti) must be replaced by value Smax in the figure, whereby blocks **30** and **31** are unnecessary. In the "Initial" state, the terminal device circles the loop formed by blocks **30**, **31**, **32** and **33**. After having transmitted a packet in block **34** and received the acknowledgment of the RLC level in block **35**, it moves to the "Continuous" state. In blocks **36** and **37**, the numerically corrected power value Sc(tc) according to the closed-loop control will be calculated. Here the measured result of the received signal quality transmitted together with the acknowledgment message has been marked with term RXQUAL. If there is a short break between the transmission of the packets, the terminal device keeps on circling around the loop formed by the blocks **38** and **40**, which is broken by transmission of a new packet or if the time limit predetermined for the "Continuous" state expires. For the graphical clarity, the fact that the updating of the value Si(ti) continues also in the "Continuous" state, is not included in the flow diagram, but based on what has been stated above it should be clear that in block **39**, always the latest, updated Si(ti) value will be used for calculating the transmission power.

Also the recovery from error states by increasing the transmission power can be added to the method in accordance with the present invention. In that case the device sending messages supposes automatically that if transfer of a certain packet fails, the transmission power has been insufficient and it will be corrected upwards by the biggest permissible correction step (the same as marginal factor M). In case also the channel allocation requests, that means, the so called random access messages transmitted by the terminal device prior to the actual transfer of packets, are transmitted with the power level determined by the open-loop control in accordance with the invention, also the automatic priority rating of the important channel allocation requests can be added to the method. If the terminal device must send a channel allocation request that relates e.g. to an emergency message or is otherwise especially important, it can set automatically the transmission power to be by several decibels bigger than the valid default value of the transmission power given by the formula (1).

The time limit after which the terminal device returns to the "Initial" state can also be dynamically determined e.g. so that if the transmission power has been corrected many times during one packet switched link, the time limit will be set shorter than in case the transmission power has remained the same for a long time. The same dynamical changing possibility concerns all parameters A, B, $\alpha$ and $\beta$ of the formula (3) or, in case some other expression of function f is used instead of the formula (3), other parameters that have influence on the significance of different types of correction factors.

The present invention is of advantage compared with the prior art, because the transmitting device is always aware of the default value of the transmission power for transmitting the following packet, irrespective of how long is the time that has passed from the transmission of the previous packet, whereby the transmitting device can start the transmission immediately, when the packet to be transmitted is ready. This is a significant improvement compared with systems in which the base station must first measure the quality of the data transfer link and give to the terminal device a power control command based on the measurements, according to which the terminal device must control its transmission power to be correct before transmitting the packet. The method in accordance with the present invention connects useful features as well of the open-loop as of the closed-loop control.

We claim:

**1**. A method for controlling transmission power in a terminal device of a cellular radio system, a radio connection of which with a certain base station comprises an alternative first state **(10)** and second state **(11)**, in the first state of which the terminal device receives **(30)** signals transmitted regularly by the base station and in the second state of which the terminal device additionally g transmits **(34)** data as packets to the base station, characterized in that in said first state the control of the default value of the transmission power in said terminal device is based on measuring **(31, 32)** of the signals transmitted regularly by the base station, and in said second state the control of the transmission power in said terminal device is based both on a feedback transmitted by the base station on the quality of a data transfer link **(35, 36, 37, 39)** and on measuring of other signals transmitted regularly by the base station.

**2**. A method in accordance with claim **1**, characterized in that in said first state the control of the default value of the transmission power in said terminal device is based on measuring of the signal power (R0) of the signals transmitted regularly by the base station.

**3**. A method in accordance with claim **2**, characterized in that when the transmission power (SB) with which said base station transmits said signals that it regularly transmits, and the target level (t0) of a link quality, with which it is advantageous for said base station to receive packets transmitted by said terminal device, are known by said terminal device, it corrects the default value of its transmission power to correspond to the value Si(ti) that is determined by the formula

$$Si(ti)=SB+(t0-R0),$$

wherein SB is the transmission power of said base station, t0 is said target level of the link quality and R0 is the signal power measured by the terminal device in the reception of said signal.

**4**. A method in accordance with claim **1**, characterized in that in said first state the control of the default value of the transmission power in said terminal device is based on measuring of the C/I ratio of the signals transmitted regularly by the base station.

**5**. A method in accordance with claim **1**, characterized in that in said second state the meaning of the feedback being carried by a certain acknowledgment message transmitted by said base station and expressing the quality of the data transfer link, for the control of the transmission power of said terminal device, is the smaller the longer the time is that has passed from the reception of the feedback in question by said terminal device.

**6**. A method in accordance with claim **1**, characterized in that the terminal device that is in said second state moves to the first state when a certain predetermined time limit from reception of the feedback on the latest transmitted packet has